

8/ppts

10/533638

- 1 JC20 Rec'd PCT/PTO 03 MAY 2005

Footwear, particularly sports footwear

The invention relates to footwear and, in particular, sports footwear, e.g. a ski boot, cross-country ski boot or the like, whose upper includes a front cap and a rear cap.

Conventional shoes are made up in a manner that the upper material, e.g., leather or any other material, is pinched around a last, whereupon a more or less flat sole is glued on. In that case, a foot bed must be placed into the shoe to realize the natural shape of the foot in its three-dimensionality. The shoe upper is usually punched from a flat material, which is brought into the three-dimensional shape of the last by appropriate darts and, in particular, by a reshaping process performed during the pinching procedure. This involves a more or less strong exertion of force. Due to the recovering abilities of the upper and lining materials, the final internal volume of a shoe is only difficult to control, because the material may shrink if the upper fits too tightly on the last, or the volume may be too large if the upper has not been sufficiently pinched around the last. Volumes differing between left and right shoes as well as from pair to pair are not unusual.

Constructions in which textile insoles are sewn with the upper are also known (Strobel make). This helps achieve some sort of three-dimensionality of the heel (spherical heel) and joint. As a rule, insoles of that type are, however, soft and supple, thus lacking sufficient torsional stiffness.

There are also combinations in which the forefoot is Strobel-stitched and the rear shoe part is provided with a hard, flat half-insole.

In all types of construction, the heel height is applied outside of the insole in the form of a midsole or outsole.

If an anatomically shaped foot bed is sought, the latter is normally inserted into the shoe subsequently in the form of a more or less shaped slipsole. The anatomical value of such slipsoles is a debatable point, since for cost reasons they are frequently made of unstable materials such as, e.g., EVA.

It is the object of the present invention to provide a shoe of the initially defined kind, which avoids the above-mentioned drawbacks of known shoes while ensuring an anatomically shaped form.

This object is achieved in that the shoe is comprised of a multi-component system in which the upper is connected, preferably glued, with preformed toe and heel parts. A waterproof upper will be obtained by a gluing connection.

According to a further characteristic feature of the invention, the toe and heel parts of the upper are each comprised of a three-dimensional part corresponding to the shape of the last and produced as a plastic molded part. This enables the production of molded parts of various stiffnesses.

In a preferred manner, the shoe structure is comprised of three parts, namely a front cap, a rear cap and a wedge, which parts are adapted to a last and interconnected, preferably by gluing. This shoe design offers the advantage that the reshaping of shoe parts from two-dimensional into three-dimensional forms, as has been required so far, is no longer necessary such that an exertion of force or distortion is no longer needed. Gluing may naturally be replaced by any desired seam, particularly if no waterproof shoe is sought.

According to a further characteristic feature of the invention, an insole may be sewed in in the region of the forefoot.

According to still another characteristic feature of the invention, it is also feasible to conventionally glue the region of the forefoot via a traditional insole (glue-pinching).

A particularly comfortable shoe is obtained by the measure according to claim 5.

Another advantage results from the measure according to claim 6 as well as the measure according to claim 7.

The measure taken according to claim 8 provides a gradual transition between the wedge and the upper.

Finally, also the measure according to claim 9 contributes to providing an advantageous shoe design.

Further characteristic features of the invention will be explained in more detail by way of the drawings, which depict embodiments of the shoe structure according to the invention in simplified form.

Therein:

Fig. 1 illustrates an embodiment of a shoe in the longitudinal section;

Fig. 2 is a cross sectional view of the shoe in the heel region;

Fig. 2A is a variant of the embodiment according to Fig. 2;
Fig. 3 shows another variant;

Fig. 4 illustrates a cross section of the shoe according to the invention in the toe region, with the external upper and the outsole having been omitted for reasons of simplicity;

Fig. 4A shows a variant of the embodiment according to Fig. 4;

Fig. 5 shows a variant of the embodiment according to Fig. 1;

Fig. 6 illustrates a cross section of the shoe according to Fig. 5 in the heel region; and

Fig. 7 shows another variant of the embodiment of the shoe according to Fig. 1.

In Fig. 1, a last is denoted by 1 and an anatomically shaped wedge provided in the heel region is denoted by 2. The wedge 2 substitutes an insole and extends as far as to the ball. Also integrated in the wedge 2 is the heel, whose height corresponds to that of common shoes and safeguards the necessary torsional stiffness. In order to obtain a general stability of the shoe, such wedges may preferably be injection-molded or formed from rigid foam or similar materials. The upper contour corresponds to the anatomical shape of the foot and, to this end, is equipped with a heel bedding and a longitudinal arch. This produces relatively high lateral sides. The bottom surface of the wedge 2 may be flat or designed to have any desired contour. The lateral sides forms a relatively smooth surface including a edge at the transition towards the bottom surface. It is also feasible to incorporate a step in the lateral surface as a positioning edge for an upper 5, which may be made of a flat material and is glued with the lateral surface of the wedge 2 in the heel region as far as to the ball, i.e., in the region where it is not sewn or glued with an insole. This serves as a substitute for the usual pinching process.

The toe part of the shoe structure is comprised of a front cap 4 and the heel part is formed by a rear cap 6, said caps being three-dimensionally shaped, for instance by injection-molding, and connected, preferably glued, with the upper 5 along surfaces 7 and 8, respectively.

Since both the wedge 2 and the front and rear caps 4 and 6, respectively, are comprised of preformed parts, these parts

match perfectly and render any reshaping superfluous.

In the region of the forefoot, the wedge 2 is connected with the front cap 4 by an insole 3, which is secured either by a Strobel seam 9 or by gluing or the like.

The volume of the shoe is precisely predetermined and controllable.

The outsole is realized by a shell sole (not illustrated) precisely constructed to fit the preformed parts, glued with the sewn-in or glued insole 3 and the upper 5 in the forefoot region, with the lower side of the wedge 2 in the rear region, and with the upper 5 on its sides.

This design enables the efficient production of shoes without the use of expensive machines and complex operating procedures difficult to control. The internal volume is faithful to the last and precisely controllable, with an anatomical walking surface being safeguarded too. The combination of a Strobel-seamed or pinched forefoot and a wedge in the joint and heel region allows the flex zone to be optimally positioned and the torsional stiffness to be precisely defined and controlled.

The construction according to the invention ensures the fit to always precisely match the volume of the last and assembling errors to be reduced to a minimum, so that no differences in the fit between left and right shoes, or from pair to pair, will occur.

The make according to the invention imparts a high torsional stiffness to the shoe. In addition, the flexibility of the shoe is controllable in the region of the ball of the foot.

It goes without saying that various structural configurations may be chosen in the context of the invention.

Thus, Fig. 2 depicts an embodiment which comprises an external upper 19 and an outsole 10, wherein the heel height of the wedge 2 is adapted to the anatomical shape of the foot heel and has a height H. In this embodiment, the wedge bottom 2' is contoured and the outsole 10 is glued with the external upper 19 of the rear cap 6 and the wedge 2. By contrast, the outsole 10 in the embodiment according to Fig. 2A, which is provided with a grating 11, is connected with the external upper 19 by a seam 12. The seam connection is preferably provided on both sides of the shoe.

In the embodiment according to Fig. 3, the wedge 2 is

provided with a reentrant shoulder 11 for the lateral positioning of the upper 5.

Fig. 4 depicts an embodiment in which the front cap 4 is glued with the upper 5 and the insole 3 by an overlapped step 7' and 3', respectively.

In the embodiment according to Fig. 4A, the front cap 4 is merely glued with the upper 5 by an overlapped step 7, while the connection with the insole 3 is realized by a Strobel seam 9.

Figs. 5 and 6 illustrate a variant embodiment including a rear cap 6 inwardly applied on the wedge 2, and a front cap 4. In this variant, all of the parts bordering with the wedge 2 - in the present case the insole 3 and the rear cap 6 - are attached to the side of the last rather than externally or from below. This measure enables the saving of weight and an enhanced assemblability while maintaining its technical function.

For flex enhancement, the insole 3 on its lower side is additionally corrugated transversely to the longitudinal axis of the foot.

The variant embodiment according to Fig. 7 illustrates a continuous insole 3 placed on the wedge 2.

In this variant, the wedge 2 and the insole 3 are not vertically, but horizontally separated. The advantage of this construction resides in the consistency of the insole 3. The function of the foot bed and the forefoot flex are, thus, controllable by just one part, i.e., the insole 3. The wedge 2 assumes the function of providing a high torsional stiffness.